

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 11-074263

(43)Date of publication of application : 16.03.1999

(51)Int.Cl.

H01L 21/316

(21)Application number : 10-186535

(71)Applicant : FUJI ELECTRIC CO LTD

(22)Date of filing : 01.07.1998

(72)Inventor : UENO KATSUNORI

(30)Priority

Priority number : 09178766

Priority date : 04.07.1997

Priority country : JP

(54) THERMAL OXIDE FILM FORMATION OF SILICON CARBIDE SEMICONDUCTOR DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To form an SiO₂ film which is 10% or more thicker than that conditions considered to have been the fastest oxidation velocity in a conventional method in an Si surface by setting a vapor partial pressure in a mixed gas of vapor and oxygen at a value in a specific range, when forming a thermal oxide film of a silicon carbide semiconductor device. SOLUTION: When a silicon oxide film is formed on a heated SiC surface by introducing vapor and oxygen, a vapor partial pressure $p(\text{H}_2\text{O})/[p(\text{H}_2\text{O})+p(\text{O}_2)]$ is controlled within the range of 0.1 to 0.9. Here, $p(\text{H}_2\text{O})$, $p(\text{O}_2)$ express the vapor pressures of vapor and oxygen, respectively. In a thermal oxide film formation method for forming an SiO₂ film by pyrogenic oxidation for performing thermal oxidation by introducing hydrogen and oxygen, the flow ratio of hydrogen and oxygen is controlled in the range of 1:0.6 to 1:9.5. Accordingly, a partial pressure of vapor is in the range of 0.1 to 0.9 as oxidation atmosphere in a furnace.

LEGAL STATUS

[Date of request for examination] 13.05.2003

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number] 3544123

[Date of registration] 16.04.2004

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

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